

## Claims

1. A service gateway residing in a server at a head end operator for providing communication between a plurality of service providers and a plurality of applications running on a plurality of head end operator client devices comprising:
  - a server for communication between the service providers and the client devices;
  - an application level meta language for communication between client applications and service providers;
  - a communication link between the client devices and the service platform for transmission of messages between the client devices and the service gateway;
  - a transport protocol process residing in the client device for sending a transport level message encapsulating the meta language to a service provider; and
  - a conversion function for converting the client's message from the transport level protocol into a plurality of standard protocols for transmission to the service provider over the communication link.
2. The service gateway of claim 1 further comprising a transcoder for converting content received from a service provider into a format suitable for display on the client device.

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- 1     3.     The service gateway of claim 1 wherein the service gateway performs  
2           asymmetrical data compression wherein the service gateway compresses data  
3           received from a client and sends the compressed data to a service provider.
  
- 1     4.     The service gateway of claim 1 wherein the service gateway performs  
2           asymmetrical data routing of data sent to the client and sent back to the service  
3           provider from the client based on the size of the data and the availability of the  
4           broadcast stream and the point-to-point connections between the service gateway  
5           and the clients.
  
- 1     5.     The service gateway of claim 1 wherein the service gateway receives a LHTTP  
2           message encapsulating HTTP requests within a transport level message and  
3           converts the LHTTP request into a standard HTTP communication protocol.
  
- 1     6.     The service gateway of claim 1 further comprising:  
2           a data name service for resolving a service identifier of an application server for a  
3           client process identifying a service in a transport communication protocol  
4           message.
  
- 1     7.     The service gateway of claim 1 wherein the service gateway individually encrypts  
2           each fragment of a transport level message.

8. The service gateway claim 1 wherein the the service gateway sets up a business filter associated with a client to select information to be captured from a broadcast data stream for the client based on at least one of the following: client preferences, viewer profiles or transaction history.

9. The service gateway of claim 1 further comprising an offline viewer identification function which enables offline viewer payment.

10. The service gateway of claim 1 further comprising an offline order form.

11. The service gateway of claim 1 further comprising a store and forward library comprising messages having delivery timing constraints comprising "as soon as possible", "when connected", "after a random period of time", "after a set period of time", "after a specified occurrence, event or message" and "spread stored messages over available time and bandwidth.

12. The service gateway of claim 1 wherein the service gateway receives a message from a client indicating the client's available memory and the service gateway checks incoming messages directed to the client to determine that the available memory is sufficient to receive the message before forwarding the message to the client.

1 13. The service gateway of claim 1 further comprising:  
2 sequence numbers in a message is sent from a client to the service gateway,  
3 wherein a sequence number is associated with one of a plurality of sequence-  
4 numbered message fragments;  
5 a message table wherein each message fragment sequence number is stored in a  
6 table along with a time of receipt; and  
7 a sliding time rejection window for rejection of message packets with sequence  
8 numbers appear in the rejection window.

1 14. The service gateway of claim 1, wherein the service gateway creates a session  
2 identifier derived from a hardware identifier and inserts a session identifier in  
3 place of the hardware identifier into each communication between a client and a  
4 service provider.

1 15. The service gateway of claim 1 further comprising:  
2 a socket type abstraction layer created by the service gateway to accommodate  
3 User Datagram Protocol (UDP) data, wherein the socket type abstraction layer  
4 runs on top of UDP and encapsulates UDP into transport level protocol messages.

1 16. The service gateway of claim 1 further comprising:

2 a registration authentication function for multiple users at a single client with  
3 multiple users, through nicknames, personal identifiers and client hardware  
4 identifier (HID).

1 17. The service gateway of claim 1 further comprising:  
2 business agents that control transactions and control access by the service provider  
3 access to user information.

1 18. The service gateway of claim 1 further comprising:  
2 business agents which insert, replace and delete client identification information  
3 from a message from a client to a service provider during a transaction, thereby  
4 hiding the identity of the client from the service provider.

1 19. The service gateway of claim 18 wherein the amount and type of client business  
2 information provided to a service provider, is guided by business rules depending  
3 on an agreement between the service provider and a network operator.

1 20. The SGW of claim 19 wherein the business agents provide default values and  
2 control access to user information.

1 21. The SGW of claim 11 wherein the store and forward function enables delivery of  
2 a message from the client to be transmitted to a service at a later time, wherein a

3 plurality of messages are dispersed for delivery over a period of time to reduce  
4 peak transmission load.

1 22. A service gateway residing in a service platform at a head end operator for  
2 providing communication between a plurality of service providers and a plurality  
3 of applications running on a plurality of head end operator client devices  
4 comprising:  
5 a server for communication between the service providers and the client devices;  
6 an application level meta language for communication between client applications  
7 and service providers;  
8 a communication link between the client devices and the server for transmission  
9 of messages between the client devices and the service gateway;  
10 a transport protocol process residing in the client device for sending a transport  
11 level message encapsulating the meta language to a service provider;  
12 a conversion function for converting the client's message from the transport level  
13 into a plurality of standard protocols for transmission to the service provider over  
14 the communication link, wherein the service gateway compresses data received  
15 from a client data and sends the compressed data to the service provider and the  
1 service gateway performs asymmetrical data routing of data sent to the client and  
2 sent back to the service provider from the client based on the size of the data and  
3 availability of the broadcast stream and the point-to-point connections between

4 the service gateway and the clients and wherein the service gateway individually  
5 encrypts each fragment of a transport level message.

1 23. The service gateway of claim 23 wherein the service gateway receives a LHTTP  
2 message encapsulating HTTP requests within a transport level message and  
3 converts the LHTTP request into a standard HTTP communication protocol.

1 24. The service gateway of claim 22 further comprising:  
2 a data name service for resolving a service identifier of an application server for a  
3 client process.

1 25. The service gateway claim 22 wherein the the service gateway sets up a business  
2 filter associated with a client to select information for the client based on at least  
3 one of the following: client preferences, viewer profiles or transaction history.

1 26. The service gateway of claim 22 further comprising an offline viewer  
2 identification function which enables offline viewer payment;  
3 an offline order form; and  
1 a store and forward library comprising messages having delivery timing  
2 constraints comprising "as soon as possible", "when connected", "after a random  
3 period of time", "after a set period of time", "after a specified occurrence, event or  
4 message" and "spread stored messages over available time and bandwidth.

27. The service gateway of claim 22 wherein the service gateway receives a message from a client indicating the client's available memory, wherein the service gateway checks incoming messages directed to the client to determine that the available memory is sufficient to receive the message before forwarding the message to the client, the service gateway further comprising:

sequence numbers in a message is sent from a client to the service gateway, wherein sequence number is associated with one of a plurality of sequence-numbered message fragments;

a message table wherein each message fragment sequence number is stored in a table along with a time of receipt; and

a sliding time rejection window of recently used sequence numbers with a time stamp for each sequence number wherein fragments received with a sequence number that appears in the sliding window are disregarded.

28. The service gateway of claim 22 derived, wherein the service gateway creates a session identifier from a hardware identifier and inserts a session identifier in place of the hardware identifier into each communication between a client and a service provider, further comprising a socket type abstraction layer created by the service gateway to accommodate User Datagram Protocol (UDP) data, the socket type abstraction layer running on top of UDP and encapsulating UDP into transport level protocol message



1        29.    The service gateway of claim 22 further comprising:  
2            a registration authentication function at a single client with multiple users,  
3            wherein multiple users are authenticated through nicknames, personal identifiers  
4            and client hardware identifiers(HID);  
5            business agents that control transactions and control access by the service provider  
6            access to user information, wherein business agents insert, replace and delete  
7            client identification information from a message from a client to a service  
8            provider during a transaction, thereby hiding the identity of the client from the  
9            service provider, wherein the amount and type of client business information  
10           provided to a service provider, is guided by business rules depending on an  
11           agreement between the service provider and a network operator.